**ABSTRACT SUBMITTED FOR 2011 US-IALE, PORTLAND**

**Title:** Within-stand variation in aboveground cover and nitrogen availability following stand-replacing fire in subalpine forests of Greater Yellowstone

**Authors:**

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| Monica G. Turner | University of Wisconsin |
| William H. Romme | Colorado State University |
| Erica A. H. Smithwick | Pennsylvania State University |
| Daniel B. Tinker | University of Wyoming |
| Jun Zhu | University of Wisconsin |


Natural disturbances affect the magnitude and spatial structure of variability in ecosystems, but variability within disturbed patches has not been well researched. We studied burned conifer forests in Greater Yellowstone to address two questions: (1) How do within-stand variability and spatial structure of aboveground cover and soil N availability change during the first four years following stand-replacing fire? (2) At fine scales (within stands), is N availability related to aboveground cover? Aboveground cover and soil N availability were measured annually from 2001-2004 using a spatially explicit sampling design (n = 81 cores/plot) in four 0.25-ha plots that burned during summer 2000. Within-stand variability (based on the coefficient of variation) in postfire vegetative cover declined with time since fire, whereas variability in abiotic cover was greatest 2-3 yrs postfire. The soil nitrate pool was more variable than the soil ammonium pool, but annual net nitrification rate was less variable than annual net N mineralization rate. Spatial structure (based on semivarograms) was observed at multiple scales in many response variables, but there was no obvious congruence in spatial scales of autocorrelation for aboveground cover and soil N availability. Nevertheless, significant Spearman correlations at the core level indicated that aboveground cover and soil N were coupled following severe fire, and that the dominant influence was from aboveground cover to soil N, rather than vice versa. Initial patterns of fire severity and re-vegetation contributed to dynamic fine-scale heterogeneity in soil N availability for at least four years after severe wildfire.

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**Topics:**

1st Forest ecology
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